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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/750,293	BRADY, THOMAS P.
	Examiner	Art Unit
	Kevin Siangchin	2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _6_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on ______ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-15_ is/are pending in the application.

4a) Of the above claim(s) ______ is/are withdrawn from consideration.

5)☐ Claim(s) ______ is/are allowed.

6)☒ Claim(s) _1-15_ is/are rejected.

7)☐ Claim(s) ______ is/are objected to.

8)☐ Claim(s) ______ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _29 December 2000_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on ______ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ______ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ______ .

4) ☐ Interview Summary (PTO-413) Paper No(s). ______ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

Drawings

1. New corrected drawings are required in this application because the drawings submitted by the applicant fail to illustrate in sufficient detail the essential features and operational aspects of the claimed invention, as set forth in the applicant's disclosure. As a result, the drawings, as such, fail to facilitate an understanding of the claimed invention, as set forth in the applicant's disclosure. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show:

   i. the various modes of operation (i.e. "page assembly mode" and "flat banding" mode);

   ii. the various encoding modes (i.e. LZW compression for the image data and pack-bit compression for the template image data);

   iii. the logical steps involved in discerning the input image data (e.g. discerning whether image data represents a template);

   iv. the logical steps involved in changing the state of the proposed invention by a selection of the aforementioned modes of operation and modes of encoding, in response to these data and various other parameters of the invention;

and so on, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The inclusion, for example, of flow diagram(s) and/or state diagram(s), as well as more illustrative versions of the current block diagrams, may clarify some of these details. The objection to the drawings will not be held in abeyance.

Specification

3. The specification of the claimed invention must contain a "Detailed Description of the Invention" section. This must provide a description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described, and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication, which adequately describes the subject matter. While the applicant's disclosure does contain a description of the claimed invention that marginally satisfies these requirements, that description lies under the heading "Best Mode for Carrying out the Invention" (see page 10 of the disclosure). The disclosure is for this reason objected to. The heading, "Best Mode for Carrying out the Invention", should be replaced with "Detailed Description of the Invention".

4. The disclosure is objected to because of the following informalities:

i. From page 8, lines 15-25, of the applicant's disclosure:

> "... the processor is further configured to determine if the stored sequence of characters corresponds to a primarily white page or a primarily black page image, which might be the case for a template type image. If so, the processor encodes the stored sequence of characters...operation. If not, the processor encodes the stored first sequence ..."

Note that the phrases, "If so", "If not", and "stored first sequence" have been emphasized. With regard to the conditional phrases, "If so" and "If not", these phrases, as such, introduce an ambiguity as to what the condition is based on. That is, the reader cannot determine from an initial reading of the conditional, "If so...", whether its antecedent is intended to be that the stored sequence is primarily black or that the stored sequence is primarily white or that the stored sequence is primarily black and white.

ii. Clearly the ambiguity introduced by the phrase, "If not", follows from the ambiguity introduced by the phrase, "If so".

iii. In regard to the phrase, "stored first sequence", this phrase implies that somehow the "stored first sequence" should be treated in a different manner from subsequent stored sequences (e.g. the stored second sequence, etc.), when the condition "If not" is true. Since this is not consistent with the operation of the claimed invention, it is advised to remove the word "first" from the phrase "stored first sequence". Furthermore, in the previous sentence of the above excerpt (i.e. "If so, the processor encodes … operation."), the stored sequence of characters mentioned is not distinguished as being first.

iv. A similar error in phraseology also occurs on page 9, lines 20-30 (and in the claims. These will be addressed later.).

v. The following sentence is from page 13, lines 1-5:

> Although, the image discussed with reference to the page assembly mode may be the same as the image discussed with reference to the prior page assembly mode, conversion in the page assembly mode will typically result in even a greater amount of encoded data than the conversion in the previously discussed banding mode.

The phrase "prior page assembly mode" underlined above appears to a typographical error. Given the context in which this phrase appears and the ambiguity as to what prior page assembly mode to which the applicant is referring, it is suggested that the applicant replace "prior page assembly mode" with "banding mode". This would be consistent with previous and subsequent portions of the disclosure.

vi. Throughout the disclosure, reference is made to the "pack-bit" compression technique. As described in the specification, this technique is essentially the same, in principle, to the well-known "PackBits" method of compression. Indeed, the pack-bit method described by the applicant and the aforementioned PackBits method differ only in name. It would, therefore, be preferable, in the interest of clarity, that the applicant uses the more recognizable and more commonly used name, "PackBits", when referring to this compression technique. Note that name PackBits (or PB, where appropriate) will be used, henceforth in this document, to designate the applicant's pack-bit method.

Appropriate correction is required.

Claims

5. Claim 12 is objected to because of the following informality. Claim 12 states that it is dependent on claim 10 – i.e. it describes a "system according to claim 10". Note that claim 10 relates to a method, whereas claim 12 is related to a system. It is evident from his disclosure that the applicant intended that claim 12 be dependent on claim 11. Rewriting the preamble of claim 12 to: "A system according to claim 11" would rectify this matter. Appropriate correction is required.

<u>Rejections under 35 U.S.C. § 112</u>

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 2 recites:

> An encoder according to claim 1, wherein the processor is further configured to encode the stored first sequence of characters in accordance with a pack-bit compression technique in the first mode of operation and in accordance with a LZW compression technique in the second mode of operation

Thus, when taken in light of these aspects of the encoder described in claim 1, the processor, as described in claim 2, is configured so that, if the sequence of characters representing an image is determined to correspond to a banded image, that processor will operate in a first mode and, thereby, encode using PackBits compression; and, if, on the other hand, the sequence of characters representing an image is determined to correspond to a page image, that processor will operate in a second mode and, thereby, encode using LZW compression. However, the applicant recites in the specification on page 13, lines 14-31:

> In the banding mode, the image bands may be satisfactorily converted using a LZW technique. In the page assembly mode, a template image, of say 16 megabytes, may be satisfactorily converted using a PB technique. However, the PB technique will often produce unsatisfactory results if used to convert the bands of the other of the multiple images. Accordingly, in the page assembly mode, these bands are converted using an LZW technique. Thus, in the page assembly mode, different compression technique are utilized for a single image and perhaps even in a single job.

> Accordingly, in the first embodiment of the present invention, the RIP 1050 is selectively operable in either the banding or the page assembly mode operation. Hence, in operation, the RIP 1050 initially scans the received image data representing the image, or image bands if the bands are sliced during pre-processing, to determine if banding mode or page assembly mode operations is required. If it is determined that banding mode operation is required, the RIP 1050 implements an LZW technique to convert the image data into encoded data.

Clearly, that which is set forth in claim 2 contradicts the operation of the claimed invention as described in the above excerpt from page 13, lines 14-31 of specification. According to claim 2, the processor of the claimed encoder should not encode using LZW compression while operating in the said first mode, but the specification clearly suggests the opposite. Given the well-known amenability of the LZW technique to image compression over the PB technique, it is reasonable to assume that the applicant's claimed invention was intended to behave in a manner consistent with the excerpt of page 13, lines 14-31 of the applicant's specification listed above and not as in claim 2. Therefore, claim 2 fails to point out and distinctly claim that subject matter which pertains to the applicant's claimed invention. Claims 7 and 12 are similarly rejected.

9. In claims 1-4 and claim 14, the applicant refers to a "first sequence of characters". Referring specifically to a "first sequence of characters", in the manner of claims 1-4 and claim 14, implies that the evaluation, encoding and/or compression of that sequence are distinguished, in some way, from the evaluation, encoding and/or compression of subsequent sequences (e.g. the second sequence of characters, etc.). This is not consistent with the operation of the claimed invention, as it is put forth in the applicant's disclosure.

10. Claims 3 and 13 claim a processor and raster image processor, respectively, that is "further configured to encode the stored first sequence of characters in accordance with a pack-bit compression technique in the second mode of operation". In light of claims 2 and claim 12, of which claims 3 and 13 are dependant, respectively, the processor and raster image processors are configured so that, while operating in the second mode, they encode the sequence of characters in accordance with the LZW compression technique and in accordance with the PackBits compression technique. It is unclear from claims 3 and 13 whether the processor and raster image processor, respectively, while in the second mode of operation, encode the image data using both compression techniques in succession or encode the image data using one technique, as opposed to the other, or that the processor and raster image processor both are configured to support both modes of compression, while in the second mode of operation.

11. In claim 4, the applicant recites:

> An encoder according to claim 1, wherein: if the first sequence of characters is determined to correspond to the page image, the processor is further configured to determine if the stored first sequence of characters

> corresponds to one of a primarily white page image and a primarily black page image, and, if so, to encode the stored first sequence of characters in accordance with a first compression technique while operating in the second mode of operation, and, if not, to encode the stored first sequence of characters in accordance with a second compression technique, different than the first compression technique, while operating in the second mode of operation.

Note that the phrases, "if so" and "if not", have been emphasized. These phrases, as such, introduce an ambiguity as to what the condition is based on. That is, the reader cannot determine from an initial reading of the conditional, "if so, ... second mode of operation" (with respect to the pertinent claims), whether its antecedent is intended to be that the stored sequence is primarily black or that the stored sequence is primarily white or that the stored sequence is primarily black and white. In turn, the antecedent of the conditional, "if not, ... second mode of operation", is likewise ambiguous. In this regard, claim 4 does not precisely point out the logic involved with this aspect of the claimed invention.

12. Claims 4, 9, and 14 propose actions to be performed on the stored image data depending upon the determination of whether the stored image data corresponds to either a "primarily black image" or a "primarily white image". It is unclear from the specification of the claimed invention what constitutes "primarily". Thus, claims 4, 9, and 14 lack the definiteness required by 35 U.S.C. 112, second paragraph.

13. Claims 8 recites:

> A method according to claim 7, further comprising: encoding the received image data in accordance with the first encoding technique, if the received image data is determined to correspond to the page image d that is.

In light of claims 6 and 7, of which claims 8 is dependant, the method for compressing image information, would include encoding the received image information in accordance with the LZW technique and further in accordance with PackBits compression technique, if the image data is determined to correspond to the page image data. It is unclear, then, from claim 8 whether the method of compression encodes the image data using both compression techniques in succession or encodes the image data using one technique, as opposed to the other, if the image data is determined to correspond to a page image.

Rejections under 35 U.S.C. § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claim 1 rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai (U.S. Patent Number 6009242) in view of Zimmerman (U.S. Patent Number 5535311).

16. Anzai discloses an apparatus for outputting image data to a printer that includes a generator, a determining device, and a compression device. The apparatus further consists of a CPU (Anzai, Fig. 1, reference number 4), a RAM (Anzai, Fig. 1, reference number 5), and a ROM (Anzai, Fig.1, reference number 3). The image data is generated externally by an external apparatus (Anzai, Fig.1, reference number 1) – e.g. a host computer (see Anzai, column 5, lines 33-34) – and can be stored in the RAM. This RAM is assigned to store bitmap image data (i.e. "a sequence of characters representing an image") and, hence, is analogous to the memory of applicant's claim 1 (see Anzai, column 5, lines 48-49). The ROM stores various control programs (e.g. the compression routines) and various kinds of information such as the output method information. The CPU executes these control programs. See Anzai, column 5, lines 41-45. The CPU constitutes the means for compressing image data on the basis of the data compression program stored in the ROM (see Anzai, column 7, lines 6-8). The CPU further constitutes the means for selecting data on the basis of a program stored in the ROM (see Anzai, column 7, lines 9-11). Hence, the CPU can be regarded as constituting the determining device. The determining device (i.e. the CPU) determines whether or not a band (where a bands are defined by Anzai to be divided areas of the bitmap of one page, such that together they constitute the entire bitmap of that page, see Anzai, column 6, lines 38-43 and Fig. 2C) or a page of the image data generated by the generator (e.g. the said external apparatus) is to be compressed, on the basis of an amount of the generated image data to be transferred to the controller (Anzai, Fig.1, reference number 7). The compression device (i.e. the CPU) compresses the image data generated by the generator (e.g. the said external apparatus) into compressed data by a band unit or a page unit, in accordance with a determination from the determining device. See the abstract of Anzai. Thus, the CPU (Anzai, Fig. 1, reference number 4) and ROM (Anzai, Fig.1, reference number 3), together constitute a processor configuration that is capable of distinguishing the image data contained in the RAM as being either a page(s) of image data or a band(s) of image data. The output of this processor configuration is image data compressed per band unit or per page unit. In this regard, this processor configuration, in combination

with the RAM (Anzai, Fig. 1, reference number 5), constitutes what can be reasonably considered as an encoder for compressing image information. Furthermore, this combination is capable of determining whether the image data corresponds to a page(s) of an image(s) or a band(s) of an image and applying an, albeit singular, method of compression to these data, in accordance with that determination. Thus, Anzai addresses those aspects of applicant's claim 1. However, Anzai does not disclose with this combination, the ability of this combination to encode the image data, as described in applicant's claim 1, using two distinct encoding modes, where one mode is used when the determination is that the image data corresponds to a band(s) of an image and the other mode is used when the determination is that the image data corresponds to a page(s) of an image(s).

17. The usage of plural encoding methods in image data compression, whereby each encoding method is applied to a different set of image data (where that set or image data may be representative of a whole image or sections of an image) depending upon the characteristics of that image data set, is well known. Zimmerman discloses such a system. Zimmerman discloses a method for identifying an image type of a multi-pixel image, which is employed in an apparatus that includes multiple data compression procedures. (Note that compression is a type of encoding and will, henceforth, be referred to interchangeably with encoding when the distinction is not important.) The data compression procedures operate with varying efficiency on different image types. Zimmerman assigns to each image type a corresponding compression procedure depending on the amenability of that procedure to effectively compressing images of that type. See the "Summary of Invention" of Zimmerman. Specifically, Zimmerman's system contains within a RAM (Zimmerman, Fig. 1, reference number 18) an image classification procedure (Zimmerman, Fig. 1, reference number 22) that enables one of the compression procedures stored in the ROM (Zimmerman, Fig. 1, reference number 20) to be selected that is best suited to the pixel image. By "best suited" it is meant that the selected compression procedure will enable the best available data compression of the pixel image, given the image's determined characteristics. See Zimmerman column 4, lines 27-34. The essential aspect of Zimmerman, as it pertains to claim 1 of the applicant, is the selection of one of a multitude of image compression procedures, based on the characteristics of the image or, more specifically, the data representative of that image. One of ordinary skill in the art could straightforwardly incorporate the ROM of Zimmerman into the combination of Anzai discussed above or extend the ROM in the said combination of Anzai to include the multiple compression procedures of Zimmerman, while maintaining the aforementioned determination device of Anzai. The

logic of Anzai's determination device can be incorporated into Zimmerman's method and apparatus by substituting the logical steps of image characterization (steps 32 —46, Fig. 2 in Zimmerman) with the logic of the said determination device (itself a means of image characterization). In this way, one would obtain an encoder, consisting of a CPU (processor) and RAM (memory) for storing image data, wherein the processor is configured (by means of instructions contained in a ROM or ROMs) to encode (compress) image data using one compression procedure when the image data corresponds to a page image and to encode (compress) image data using another different compression procedure when the image data corresponds to a band of an image. The motivation to modify Anzai in the manner described above is provided in Zimmerman (see Zimmerman, column 1, lines 41-45). Such a modification would provide the most efficient encoding (compression) scheme for the respective types of image data, thereby, accommodating both image types (page images and bands of page images) and reducing memory requirements. It would, therefore, have been obvious to one of ordinary skill in the art, at the time of applicant's claimed invention, to modify Anzai's print controller apparatus, in the manner described above, or otherwise, so as to incorporate those aspects of Zimmerman's method and apparatus for image-type determination and optimum compression selection that were detailed above.

18. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 1 above, and further in view of Onondera (U.S. Patent 6181435). As described above, the encoder originating from the combination of Anzai and Zimmerman can support and select from a multitude of compression methods. One such method that Zimmerman suggests is a Lempel-Ziv type compression (e.g. LZ77, LZ78, LZW). See Zimmerman, Fig. 1, reference number 20 and column 4, lines 20-26. Clearly, the usage of Lempel-Ziv compression methods, such as the LZW compression method, in the said encoder is supported and is suggested by the teachings of Zimmerman. However, Zimmerman and Anzai, as applied above, do not explicitly teach the usage of the PackBits compression method as a mode of encoding in the manner put forth by the applicant's claim 2.

19. Both the PackBits and LZW compression are well known and commonly used in the art for image data compression. For instance, Onondera suggests the usage of the PackBits compression method in an image forming method and apparatus. It should be noted that, although Onondera's invention, as such, does not constitute an encoder, such as that which is claimed by the applicant in claims 1-2 or taught by Anzai and Zimmerman, as described above in paragraphs 15-17 above, it does relate to those aspects of the applicant's claim 2. In particular,

Onondera's invention performs image compression on input image data in units of bands and, moreover, selects a compression method, from a set of multiple compression methods, based on the results of some determination means or processes (see Onondera, Fig. 3 and "Summary of Invention"). Thus, the suggestion made in Onondera, column 12, lines 4-10, to use the PackBits compression method as means to compress image data is applicable to the applicant's claim 2.

20. As discussed above, the encoder of claim 1 can accommodate any two distinct compression methods. Although the usage of PackBits compression in the said encoder's first mode of operation and LZW compression in the said encoder's second mode of operation may not have been arbitrary, on the part of the applicant, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to use any two distinct compression and/or encoding methods. The motivation to employ these compression methods as stated in claim 2, as opposed to other compression methods, is supplied in the previous paragraph.

21. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman. Note that this claim was rejected earlier under 35 U.S.C. 112(2) as not clearly specifying whether the processor is configured so that, while in the second mode of operation, it encodes the image data using both compression techniques in succession or it encodes the image data using one technique, as opposed to the other, or that the processor is configured to support both modes of compression, while in the second mode of operation. Note that in the exposition that follows, an assumption is made that the latter processor configuration was intended – that is, processor is configured to support both modes of compression, while in the second mode of operation.

22. As discussed above, one of ordinary skill in the art can construct an encoder, in accordance with claims 1 and 2, using the aspects of Anzai and Zimmerman's inventions that were previously described, in addition to that which well known in the art about PackBits and LZW compression (see paragraphs 15-20 above). The PackBits and LZW compression techniques are already present in the encoder as per claim 2. As mentioned above, the routines that embody these compression techniques can be stored in the ROM (Zimmerman, Fig. 1, reference number 20), where they may be readily accessed by the processor. Thus, it would have been straightforward to one of ordinary skill in the art, at the time of the applicant's claimed invention, to extend the configuration of the processor to also support the PackBits compression technique, while the processor operates in the second mode, since the PackBits compression technique is already present in the encoder.

23. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 1 above, and further in view of Ancin, et al. (U.S. Patent Number 6038340). The determining device (see above) of Anzai functions to distinguish between image data corresponding to a page image and image data corresponding to a band(s) of an image. However, Anzai and Zimmerman, do not disclose a means to differentiate between image data corresponding to a primarily black page image and primarily white page image.

24. Note that the definition of the word "primarily", as meant in the applicant's claims and disclosure, is unclear (see above for an explanation). In what follows, primarily black image and primarily white image, are assumed to mean that a majority of the image is black and that a majority of the image is white, respectively. In regard to the ambiguity produced by the phrases, "if so" and "if not", contained in the wording of this claim (see above for an explanation), it is assumed that "if so" means "if the sequence of characters representing an image corresponds to either a primarily black image, or the sequence of characters representing an image corresponds to a primarily white image". This condition is true if the said sequence of characters corresponds to a primarily white image, or a primarily black image, or a primarily black and primarily white image (which will never occur based on the definition of a primarily black image and a primarily white image). What is meant, henceforth, by "if not", as it pertains to claim 4, clearly follows: "said sequence of characters corresponds to an image that is not primarily white and not primarily black".

25. Methods for the classification or identification of an image or portions of an image based on color content (e.g. distinguishing images as primarily black or primarily white) are well known. Ancin, et al., for example, discuss a method and system for detecting image black and white points for a digital image stored in memory. Figure 3 in Ancin, et al. us a block diagram illustrating the details of the black and white detector program (Ancin, et al. Fig. 2, reference number 290) that embodies the said method and system. This program includes image partitioning routines (Ancin, et al., Fig. 3, reference number 310), a pixel counter (Ancin, et al., Fig. 3, reference number 320), block validity testing routines (Ancin, et al., Fig. 3, reference number 330), and pixel clustering routines (Ancin, et al., Fig. 3, reference number 340). Of particular relevance to applicant's claim 4 are the image partitioning routines, the pixel counter, and the block validity testing routines. These will be described briefly below along with their applicability to the applicant's claim 4.

26. The image partitioning routines divide the digital image (Ancin, et al. Fig. 3, reference number 285), which has N pixels by M lines, into a series of local image blocks having dimensions. Ancin, et al. does not constrain the dimensions of the local image blocks other than to imply that a block be at most N pixels by M lines. Thus, for the sake of clarity, assume that the local image blocks are divided such that their dimensions are n pixels by m lines ($n \leq N$, $m \leq M$). The pixel counter then selects an unprocessed local image block and uses a technique referred to as "thresholding' to compute the number of black pixels and the number of white pixels in the selected block. See Ancin, et al., column 4, lines 10-20. It should be emphasized here that the pixel counter performs this computation per local image block. Again, these blocks are defined as sections of the stored digital image having dimensions n pixels by m lines. In this manner, the invention of Ancin, et al. supports the processing of both page image data and band image data, as they are defines by the applicant. In particular, it would be obvious to one of ordinary skill in the art to set the dimensions n and m of the local image blocks to correspond to the dimensions of a page image or band image, as defined by the applicant. In doing so, the pixel counter and the subsequent routines shown in Fig. 3 of Ancin, et al. become capable of accepting and operating on page image data and band image data.

27. Returning to the operation of the pixel counter and block validity testing routines, the pixel counter counts a pixel having each of its RGB component values less than a black pixel threshold T_U (i.e. $R<T_U$, $G<T_U$, $B<T_U$) as a relatively black pixel, and counts a pixel having each of its RGB component values greater than a white pixel threshold T_L (i.e. $R>T_L$, $G>T_L$, $B>T_L$) as a relatively white pixel. Note that T_U and T_L can be chosen so that only black pixels and white pixels, respectively, are counted. Pixels that do not satisfy either of these criteria are considered color pixels and are ignored. The total number of relatively black pixels in a block is the "black count" C_B and the total number of relatively white pixels in a block is the "white count" C_W. Block validity testing routines examine the black and white counts C_B and C_W to determine whether the block being processed contains a sufficient numbers of black and white pixels in order to classify that block. Specifically, block validity testing routines determine whether the black count C_B is greater than a black count threshold T_B and whether the white count C_W is greater than a black count threshold T_W. See column 4, lines 20-45 in Ancin, et al.

28. Clearly, the values of C_B and C_W generated by the pixel counter contain all the information necessary for determining whether a local image block is primarily black or primarily white. Ancin, et al. further suggest the usage of the thresholds T_W and T_B, in the manner describes above, as a means to make this determination. Thus, it would

have been obvious to one of ordinary skill in the art that by setting T_W and T_B to quantitative values that constitute the applicant's definition of primarily white and primarily black, respectively, one would obtain a means for classifying a local image block as being either primarily white or primarily black or not primarily white and not primarily black.

29. As stated previously, Zimmerman suggests the selection of an optimal image compression method from multiple available image compression methods, based on the determined characteristics of the store image data. Since the aspects of Ancin, et al.'s invention that were discussed above provide for a means of classifying or determining the characteristics of stored image data, it would have be obvious to one of ordinary skill in the art to incorporate those aspects of Ancin, et al.'s invention into the aforementioned apparatus of Zimmerman, to obtain an apparatus for compressing image data that could be configured such that the compression method was selected from a multitude of compression method based on whether or not the image data corresponded to an image that was primarily black or primarily white.

30. The preceding modification of Zimmerman's invention would be straightforward for one of ordinary skill in the art. Note that the following observations would have been clear to one of ordinary skill in the art upon reading the disclosure of Ancin, et al. The procedures of the pixel counter and those aspects of the block validity testing routines mentioned above are of relatively slight complexity and require few logical steps (see Ancin, et al. Fig. 4, reference numbers 420-440). Those logical steps are generally predicated on simple numerical comparisons. The arithmetic operations involved in these procedures consist almost solely of the accumulation of C_W and C_B. The additional storage requirements are also minimal. Basically, provisions only need to be made for storing the thresholds,. T_U, T_L, T_B, and T_W, and the counts, C_W and C_B. Clearly, the hardware configuration suggested by Zimmerman (see Zimmerman, Fig. 1) should suffice to support the pixel counter and the block validation testing routines that were discussed above. These procedures could be, for example, be stored in the ROM of Zimmerman (Zimmerman, Fig. 1 reference number 20) or be loaded into the RAM at the time of execution, as suggested by Ancin, et al. (Ancin, et al., column 4, lines 1-5). Therefore, there should not be any structural or practical hindrance which would prevent or complicated one of ordinary skill in the art from incorporating the pixel counter and the block validity testing routines into the apparatus of Zimmerman, in the manner described above.

31. The apparatus, described above, obtained by incorporating the teachings of Ancin, et al. with those of Zimmerman, could be further incorporated into the encoder obtained be combining Zimmerman's teachings with those of Anzai (discussed in paragraph 17 of this document). It would be trivial for one of ordinary skill in the art to additionally provide a means for actuating this apparatus when the page/band image determining device (described to paragraphs 16 and 17 of this document) determines the stored image data corresponds to a page image (i.e. equivalently, when the encoder operates in the second mode). As a result, one would obtain an encoder similar to that which was described in paragraphs 16-17 above, and further configured so that: when it is determined that the stored image data corresponds to a page image (i.e. the encoder operates in the second mode of operation), the encoder determines whether that data corresponds to a primarily white image or a primarily black image; and if either of those is true, the encoder compresses the image using one method; and, if the stored image data corresponds to an image that is not primarily black and not primarily white, to compress that image data using another different compression method. Again, as suggested by Zimmerman, one is motivated to combine the teachings of Zimmerman, Anzai, and Ancin, et al., in the manner just described, because, in doing so, the encoder produced provides the most efficient image compression scheme for the respective types of stored image data (i.e. image data corresponding to: band images; primarily white or primarily black page images; or page images that are not primarily white and not primarily). This, in turn, has the effect of improving the efficiency of the overall encoding process and decreasing memory requirements, while accommodating all the expected types of stored image data (see Zimmerman, column 1, line 40-45 and column 3, line 10-30).

32. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai and Zimmerman, in view of Ancin, et al. as applied to claim 4 above. Claim 5 is similar to claim 2 in that it relates to the usage of PackBits as one mode of encoding the stored image data and LZW as another mode of encoding data. Therefore, with respect to claim 5, arguments analogous to those presented for claim 2, are applicable (see paragraphs 18-20 above).

33. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman. Note that the method put forth in claim 6 is manifested, in every respect, with the encoder of claim 1. Therefore, with respect to claim 6, arguments analogous to those presented for claim 1, are applicable (see paragraphs 15-17 above).

34. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 6 above, and further in view of Russ, in further view of the TIFF Specification Final Revision 6.0

and the Graphics Interchange Format Version 89a Specification. Note that the method put forth in claim 7 is manifested, in every respect, with the encoder of claim 2. Therefore, with respect to claim 7, arguments analogous to those presented for claim 2, are applicable (see paragraphs 18-20 above).

35. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman. Note that this claim was rejected earlier under 35 U.S.C. 112(2) as not clearly specifying whether the method of compressing image information is such that, if a determination has been made that the received image data corresponds to a page image, encode the image data using both compression techniques in succession or encode the image data using one technique, as opposed to the other (in other words, only one of the image compression techniques, LZW or PackBits, is employed during a single execution of the said method). Note that in the exposition that follows, an assumption is made that the latter was intended – that is, method of compressing image information is such that, if the image data is determined to correspond to a page image then encode the image data using one technique, as opposed to the other (in other words, only one of the image compression techniques, LZW or PackBits, is employed during a single execution of the said method).

36. Note that the method put forth in claim 8 is manifested, in every respect, with the encoder of claim 3. Therefore, with respect to claim 8, arguments analogous to those presented for claim 3, are applicable (see paragraphs 21-22 above).

37. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 6 above, and further in view of Ancin, et al. Note that the method put forth in claim 9 is manifested, in every respect, with the encoder of claim 4. Therefore, with respect to claim 9, arguments analogous to those presented for claim 4, are applicable (see paragraphs 23-31 above).

38. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai and Zimmerman, in view of Ancin, et al., as applied to claim 9 above. Note that the method claim 10 is manifested, in every respect, with the encoder of claim 5. Therefore, with respect to claim 9, arguments analogous to those presented for claim 5, are applicable (see paragraph 32 above).

39. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman. The methods and apparatuses of both Anzai and Zimmerman are configured to accept and process raster data. As a result, the processors discussed in Anzai and Zimmerman and, therefore, in the preceding paragraphs, constitute

what can reasonably be considered as raster image processors. Furthermore, Anzai describes a system which consists of a print controller and a print mechanism (see Anzai, Fig. 1). As discussed above, the print controller consists of a processor (see Anzai Fig. 1, "Summary of Invention", and column 5, lines 25-65), which can, as just mentioned, operate as a raster image processor. Moreover, by following the reasoning put forth in paragraphs 16-18 above, one can modify aspects of this print controller, by using the teachings of Zimmerman, to obtain a raster image processor configured to conform claimed raster image processor of claim 11. Anzai further discloses that the aforementioned print mechanism (Anzai, Fig. 1, reference number 8), comprises a printer engine for performing print operations and its controller. The print mechanism and print controller (Anzai, Fig. 1, reference number 7) are connected to each other via a predetermined interface. The print mechanism executes paper feed processing, print processing, etc. in accordance with a transmitted image data from the print controller. See Anzai, column 5, lines 56-65. When it determined that the output data transferred from the print controller via the interface is compressed data, the print mechanism expands the compressed data and proceeds with print processing. See Anzai, column 6, lines 9-13. It should, therefore, be clear that the print mechanism of Anzai conforms to the imager controller of the applicant's claimed invention in that it is configured to receive the encoded (compressed) sequence of characters and, thereupon, perform the decompression into image data suitable for imaging (which, in the case of Anzai, entails printing). Anzai does not, however, disclose a means for the said print mechanism to differentiate between encoded page image data or encoded band image data and to use a first mode and a second mode of decoding, respectively, based on that determination.

40. Zimmerman discloses a method and apparatus that allows for selective decompression. Zimmerman also describes an imaging system (Zimmerman, Fig. 1) similar to that of claim 10 and of Anzai (see previous paragraph above). This system consists of a processor (Zimmerman, Fig. 1, reference number 10) connected to a print engine (Zimmerman, Fig. 1, reference number 12) in manner similar to what was described above. This print engine is analogous to that of Anzai. According to Zimmerman, when the print engine is ready to receive image data for printing, an appropriate decompression procedure is selected from the multiple decompression procedures stored on the ROM (Zimmerman, Fig. 1, reference number 20. Also see paragraph 17 above and column 4, lines 11-26 for more details on this ROM) to recreate the pixel image. Thus, Zimmerman provides a means to selecting, on the part of the print engine, an adequate decompression procedure based on the image's determined characteristics. It should

be noted that the selection of the decompression procedure is based the corresponding compression procedure (these will generally have an inverse relationship), which itself is based on an initial determination of the image characteristics. Zimmerman's teachings, herein, can be incorporated into the aforementioned print mechanism of Anzai, thereby yielding an imager controller which is capable of receiving compressed image data and decompressing in a mode that corresponds to the mode in which that data was compressed. The mode of compression would, in this case, have been determined initially by a determining device such as that originated with the combination of Anzai and Zimmerman discussed in paragraphs 17-18 above. As discussed there, the determination upon which the determining device is based is whether stored image data corresponds to a page image or a band image. Thus, given that that the selected decompression method is generally the inverse of the previously selected compression method, the selection of the decompression method occurs implicitly upon the determination of whether stored image data corresponds to a page image or a band image. In this regard, incorporating the aforementioned teachings of Zimmerman into those of Anzai, would yield a an imager controller which is capable of receiving compressed image data and decompressing in a one mode when the received compressed image data corresponds to a banded image and decompressing in a another distinct mode when the received compressed image data corresponds to a page image.

41. The motivation to combine, in the manner described above, the teachings of Anzai and Zimmerman, as they relate to imager controllers, is as follows. Imaging systems often transmit image data from its source (e.g. the memory and processor units of Anzai, Zimmerman, and the applicant) to its destination (e.g. the print engines of Anzai and Zimmerman or the imager controller of the applicant) in a compressed form. In doing so the size of the transmitted data is reduced, thereby, conserving the bandwidth of the interface spanning the source and destination. In addition, reducing the size of transmitted data also has the advantage of reducing the memory requirements at the destination. These advantages transmitting compressed data are well known and also supplied by Anzai and Zimmerman (See the "Summary of Invention" and "Background of the Invention" in Anzai and Zimmerman). It is, therefore, obvious to one of ordinary skill in the art that the destination (e.g. the print engines of Anzai and Zimmerman or the imager controller of the applicant) have a means to decompress the received compressed data. Furthermore, if that data is compressed by multiple different means, it would be obvious to one of ordinary skill in

the art that the destination have the corresponding means of decompression and a means to select among them based on the method in which the received data was compressed.

42. Clearly, Fig. 1 of Zimmerman and Anzai suggest the combination of a processor or raster image processor with their respective print engines. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to combine the raster image processor, obtained by the combination of Anzai and Zimmerman's teachings , as discussed in paragraphs 16-18 and 39 above, with the imager controller obtained by the combination of Anzai and Zimmerman's teachings, as discussed in paragraphs 39-41 above. This combination would be produce an imaging system in accordance with that of claim 11.

43. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 11 above, and further in view of Russ, in further view of the TIFF Specification Final Revision 6.0 and the Graphics Interchange Format Version 89a Specification. Note that the raster image processor in claim 12 is essentially identical to the encoder of claim 2. Therefore, with respect to claim 7, arguments analogous to those presented for claim 2, are applicable (see paragraphs 18-20 above).

44. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman. Note that the raster image processor put forth in claim 13 is essentially identical to the encoder of claim 3. Therefore, with respect to claim 13, arguments analogous to those presented for claim 3, are applicable (see paragraphs 21-22 above).

45. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai, in view of Zimmerman, as applied to claim 11 above, and further in view of Ancin, et al. Note that the raster image processor in this claim 14 is essentially identical to the encoder of claim 4. Therefore, with respect to claim 14, arguments analogous to those presented for claim 4, are applicable (see paragraphs 23-31 above).

46. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anzai and Zimmerman, in view of Ancin, et al., as applied to claim 14 above. Note that the raster image processor put forth in claim 15 is essentially identical to the encoder of claim 5. Therefore, with respect to claim 15, arguments analogous to those presented for claim 5, are applicable (see paragraph 32 above).

47. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Siangchin whose telephone number is (703)306-0377. The examiner can normally be reached on 9:00am - 5:30pm, Monday - Friday.

48. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

49. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-0377.

50.

Kevin Siangchin
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Art Unit 2623

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